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TERRITORIAL GAPS IN RESOURCE UTILIZATION EFFICIENCY IN ANIMAL PRODUCTION

ABSTRACT

As an important factor in the formation of gross value added in agriculture, animal production experienced a noticeable deterioration trend in the last 22 years, both in the level of inputs and in input use efficiency. Expressed in 2010 prices, the animal production value nationwide decreased by nearly 64% in 2010 compared to 1990, with oscillations ranging from – 68.3% (Macro-region III) to – 60.7% (Macro-region I). The same diminution trend was also noticed at regional level, being the effect of the low efficiency of inputs use both at national and at regional (local) level. Starting from these considerations, the present approach brings into discussion the modality of production factors utilization and the territorial disparities at the level of animal production in the period 1990–2011.

Key words: efficiency, territorial gaps, production factors.

JEL Classification: Q10, P48.

1. INTRODUCTION

The utilization of available resources in an economic sector often raises problems from the point of view of their combination from the perspective of the obtained efficiency. The territorial (zonal) allocation of resources and production factors also plays an important role in the formation of the value added in the respective sector.

As in the other economic sectors, in agriculture, the cumulation of necessary inputs in the formation of resultative indicators is generated by the modality of more or less intensive allocation and utilization of the resources existing at zonal level.

Starting from these considerations, the present approach brings into discussion the modality of resource allocation and utilization efficiency in the formation of the agricultural animal production value, in its turn an input of the gross value added of the agricultural sector.

2. STATE OF KNOWLEDGE

The resources and production factors of the agrifood sector have been the object of several studies throughout the years, both in basic research, at the level of decision-makers as well as of certain investment groups interested in this activity

field. Knowing the resources in the agrifood sector and their territorial allocation represent a starting point in the establishment of investment strategies and not only, for each decision-maker or factor involved. The analysis of the resources and of their territorial allocation, as it is the case of the present approach, represents a starting point in the identification of vulnerabilities at macro-regional and regional level, providing information on the trend of indicators by large time periods.

In an economy with noticeable globalization trends, in which efficiency and competitiveness are important assets in acquiring new market niches, resources and their territorial allocation issue gets new special valences, the great agrifood firms entering the competition of designing strategies for resource utilization and combination in order to reach the strategic objectives.

The present analysis comes to complete other studies made in other economic branches, permitting the creation of a so-called dashboard of resource allocation level and of their zonal distribution.

3. MATERIAL AND METHOD

In order to make a diagnosis of the available resources utilization and territorial allocation in the formation of agricultural animal production, the present approach was based on the data supplied by the National Institute of Statistics (NIS), through the Tempo-Online database. For the analysis of the available data, well-known statistical methods were used, i.e. comparisons, dynamics and structure, the results being presented both under table form and as graphic representations.

At the same time, we must specify that in the case of the value indicators, these were transformed into comparable prices of the last available statistical year, in order to avoid certain inadequate evaluation of the results incorporating inflation in nominal prices.

For the transformation of values into comparable prices of the last year, the GDP deflator was used. A special a special mention should be made, in relation to the time period of the analysis, which was extended or sometimes restrained, in the absence of data, to other periods.

4. RESULTS AND DISCUSSIONS

The year 1990, for Romania's agri-food sector as well as for the overall economy, was the beginning of a difficult period of adjusting to the new European requirements and standards. The evolutions from the last 22 years reflect the low efficiency and competitiveness of the sector, due to the involutions in the available resources utilization and in the level of obtained production and its commercial use.

4.1. Evolutions and disparities in the territorial distribution of livestock in the period 1990–2011

In animal production, an essential resource is represented by the number of livestock herds. The total number of livestock herds steadily decreased over the years, this decrease ranging from –10.9% in horses to –63% in bovines in the year 2011 compared to 1990. By animal categories, the number of goats and bee families significantly increased, by 14.5% (bee families) and 23% (goats).

As regards the number of rabbits, it should be specified that statistical data are available starting with the year 2001 and that is why any reference to their dynamics or structural changes has in view this year.

At the level of the four development macro-regions[1], a drastic decrease of the bovine herds was noticed in the macro-region III, by 73%. In fact, except for the numbers of goats and bee families, the diminutions are noticeable in all development macro-regions (Table 1).

Table 1

The changes produced in the structure of animal numbers by categories and macro-regions, in the year 2011 compared to 1990 (%)

	Bovines	**Pigs**	**Sheep**	**Goats**	**Horses**	**Poultry**	**Bee families**	**Rabbits (2011/ 2001)**
Macroreg. I	–58.4	–52.6	–15.7	10.0	–40.5	–42.8	46.1	–58.8
Macroreg. II	–58.5	–54.9	–50.2	88.2	26.6	–26.9	0.0	–43.3
Macroreg. III	–73.0	–63.2	–59.4	13.5	–8.4	–33.4	–11.0	–5.1
Macroreg. IV	–68.9	–50.9	–37.3	–16.1	–15.5	–35.8	24.1	–52.0
Total	**–63.0**	**–55.3**	**–39.3**	**23.0**	**–10.9**	**–34.2**	**14.5**	**–48.8**

Source: Calculations on the basis of Tempo-Online data, NIS, 2012.

Per total country, extreme values are noticed in:

- Bovines (macro-region III) by 10% under the country average;
- Pigs (macro-region III) by about 8% under the country average;
- Goats (macro-region II) by about 65% over the country average;
- Horses – macro-region II, the only region that had a positive dynamics, attenuating the general overall decrease;
- Bees (macro-region I) by 22% over the country average;
- Rabbits – macro-region I experienced almost 59% decrease in the year 2011 compared to 2001, by 10% under the country average.

[1] Macro-region I includes the regions North-West and Center; Macro-region II includes the regions North-East and South-East; Macro-region III includes the regions South-Muntenia and Bucharest –Ilfov; Macro-region IV includes the regions South-West Oltenia and West.

As share in total livestock herds, the four macro-regions had fluctuating evolutions by categories. Thus, for instance, in goats, macro-region II increased its share in total livestock number by 14.44%, while in horses, macro-region II decreased its share in total by almost 12% (Table 2).

Table 2
The change of the shares of macro-regions in total livestock number, by categories, in 2011 opposed to 1990 (%)

	Bovines	**Pigs**	**Sheep**	**Goats**	**Horses**	**Poultry**	**Bee families**	**Rabbits**
Macroreg. I	3.71	1.32	10.71	–1.88	–11.97	–3.15	6.02	–8.30
Macroreg. II	4.07	0.22	–6.54	14.44	12.59	3.31	–3.72	3.22
Macroreg. III	–4.54	–4.28	–4.87	–1.58	0.40	0.34	–4.64	6.33
Macroreg. IV	–3.23	2.74	0.69	–10.98	–1.02	–0.50	2.33	–1.25

Source: Calculations on the basis of Tempo-Online data, NIS, 2012.

The evolutions at macro-regional level are the effect of the trends across regions and at county level implicitly. By regions, in the year 2011 compared to 1990, **the bovine herds** decreased from –87.5% (region Bucharest – Ilfov) to –51.9% (region North-East). An interesting evolution is the share held by each region both in the total bovine number and of in the bovine number from the macro-region they are part of. From this perspective, the region North-East is on the 1st place, with a tendency of increasing its share in total herds by 5.9%, and by 9.4% in the number of bovines in macro-region II.

Significant diminutions, yet by smaller percentages, can be also noticed **in the number of pigs across regions**. Thus, in the year 2011 compared to 1990, the number of pigs decreased from –41.7% (region South-West Oltenia) to –63.3% (region Bucharest – Ilfov). The region South-Muntenia featured the highest diminution of the share of pig herds in total country (–3.8%), while the region South-West Oltenia increased its share in total country by 3%, i.e. from 9.9% (1990) to 12.9% (2011). As regards the share by macro-regions, the region West had a 6.7% diminution in 2011 compared to 1990, while the regions South-Muntenia and Bucharest – Ilfov have maintained the same share for 22 years, i.e. 88.2% and 11.8% respectively.

The same decreasing trend could be noticed in the evolution of **sheep herds** across regions. Thus, except for the region Center, in which the number of sheep increased by 2.5% in 2011 as compared to 1990, in the remaining regions the diminution ranged from –19.7% (region West) to –66% (region Bucharest – Ilfov). The increase in the number of sheep in the region Center also resulted in the increase of its share both in total sheep herds nationwide and in the macro-region it is part of, by 9.2% and 10.5% respectively; this percentage is exceeded at macro-region level only by the region West, with a 14.8% increase. The region South-West Oltenia is at the opposite pole, which diminished its share in the sheep number of the macro-region by 14.8% (Table 3).

Table 3
The change in the share of development regions in total country and in the respective macro-region in the year 2011 compared to 1990 in the category of animals "*sheep*" (%)

	% in total	**% in macro-region**
North-West	1.5	–10.5
Center	9.2	10.5
North-East	–4.4	–3.2
South-East	–2.1	3.2
South-Muntenia	–4.6	0.6
Bucharest – Ilfov	–0.2	–0.6
South-West Oltenia	–2.9	–14.8
West	3.6	14.8

Source: Calculations on the basis of data from Tempo-Online, NIS, 2012.

As regards the **goat number**, in the period 1990–2011, there was a noticeable increasing trend in 5 out of the 8 development regions, ranging from +109,6% (North-East) to 11.9% (South-Muntenia). A worth mentioning aspect is the fact that the share of regions in the macro-regions they are part of is modified by the same percentage but in a contrary way. Thus, for example, while the region North-West diminished its share by 5.5% in macro-region I, the second component region, i.e. Center, modified its share by the same percent, but positively (Table 4).

Table 4
The change in the share of development regions in total country and in the respective macro-region in the year 2011 compared to 1990 in the category of animals "*goats*" (%)

	% in total	**% in macroregion**
North-West	–1.9	–5.5
Center	0.0	5.5
North-East	6.6	3.9
South-East	7.8	–3.9
South-Muntenia	–1.8	–1.4
Bucharest – Ilfov	0.2	1.4
South-West Oltenia	–6.9	5.8
West	–4.1	–5.8

Source: Calculations on the basis of data from Tempo-Online, NIS, 2012.

Another livestock category where a significant decreasing trend was found is represented by horses. The 11% diminution of herds per total country was the result of the significant fluctuations by each region in part. Thus, out of the 8 development regions, five featured diminutions of herds ranging from –7.6% (South-Muntenia) to –53.7% (North-West). The attenuation of the diminution per total country was due to the increase in the number of animals in three regions,

ranging from +25.9% (South-East) to +29.3% (South-West Oltenia). As share in the total herds at national level, the region North-East had an increase by almost 8%, followed by the region South-East and South-West Oltenia, by 4.8% and 4.2% respectively.

The poultry numbers also significantly decreased in the 8 development regions, from –88.8% (Bucharest – Ilfov region) to –23% (South-West Oltenia region). Thus, from the 121.4 million poultry heads in the year 1990, a number of only 79.8 million was reached in 2011, i.e. a 34.2% diminution compared to 1990.

Unlike the involutions of the categories presented so far, a noticeable increasing trend was noticed in **bee families**. The bee-keeping practice, correlated with the possibility to obtain funding for this activity, as well as with the possibility to sell the obtained products under different forms, led to the increase of the bee families from 1091 thousand families (in 1990) to 1250 thousand families (in 2011). As share of regions in total, the Center region is on the 1st place, with a 3.5% increase, followed from a small distance by North-West region (2.5%) and South-West Oltenia (1.4%).

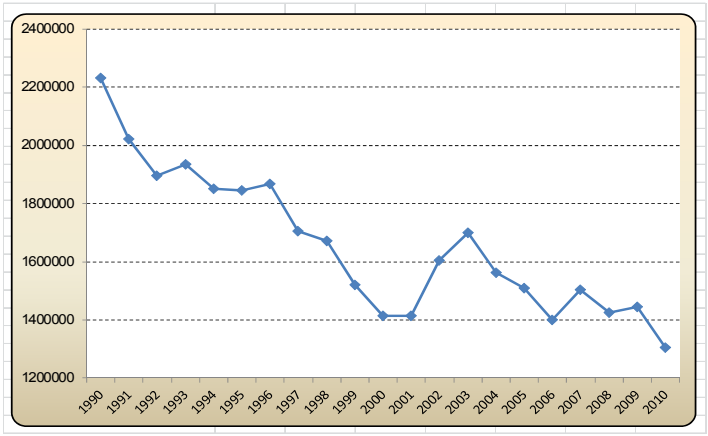
Compared to the year 2001, **the number of rabbits** experienced a significant diminution both in total country and by development regions. An exception is the region Bucharest – Ilfov, where the number of rabbits doubled in 10 years, from 5,856 in 2001 to 12,402 in 2011.

Furthermore, the region Bucharest – Ilfov increased its share in the total number of rabbits by 3.4%, i.e. from 1.1% (2001) to 4.5% (2011). The same increasing trend in share was also noticed in the regions North-East and South-Muntenia, by 4% and 2.9% respectively.

4.2. Evolutions and disparities in the territorial allocation of the physical animal production in the period 1990–2010

The significant diminution of the livestock herds had a noticeable negative effect upon the obtained physical production. Thus, in the year 2010, the total meat production decreased by 41.5% as compared to the 1990, with oscillations both by macro-regions and by development regions (Figure 1).

By development macro-regions, the most significant diminution of total meat production was found in macro-region IV (–50.8%), i.e. from 575.8 thousand tons (in 1990) to 283.5 thousand tons (in 2010). The approx. 50% decrease was determined by the significant diminution from the region South-West Oltenia, where, in the year 2010, the total meat production was down by 53.5%, compared to the 48.9% decrease in the region West. By types of meat, the most significant decline was noticed in beef (–43.2% in the year 2010 compared to the year 2000); in the pork segment, the decline was by 7.9%, being attenuated by macro-region IV, where a production increase was noticed, by 28.3%. The same increasing trend should be also mentioned in poultry meat production (36.6%), mainly due to the fast increase in macro-regions I and III (Table 5).



Source: Calculations on the basis of data from Tempo-Online, NIS, 2012.

Figure 1. Total meat production evolution in the period 1990–2010 (tons).

Table 5

The changes produced in the total meat production structure, at macro-regional level, in the year 2010 compared the year 2000 (%)

	Beef	**Pork**	**Sheep and goat meat**	**Poultry meat**
Macro-region I	–39.4	–31.6	0.3	126.8
Macro-region II	–40.9	–3.1	–28.2	–4.7
Macro-region III	–39.7	–19.5	–14.6	116.2
Macro-region IV	–55.7	28.3	–18.9	–35.6
Total	**–43.2**	**–7.9**	**–16.1**	**36.6**

Source: Calculations on the basis of data from Tempo-Online, NIS, 2012.

Across regions, the period 2000–2010 is characterized by a significantly increasing trend in poultry meat production, ranging from +171.1% (North-West) to 105% (Center). The increase of pork production in macro-region IV was mainly due to the 85% production increase in the region West, which attenuated the diminution by 25.6% in the region South-West Oltenia (Table 6).

Table 6

Changes produced in the total meat production structure, at regional level, in the year 2010 compared to the year 2000 (%)

	Bovine meat	**Porcine meat**	**Sheep and goat meat**	**Poultry meat**
North-West	–51.4	–34.6	–4.1	171.1
Center	–22.1	–28.2	3.7	105.0
North-East	–36.3	–27.4	–36.8	19.3
South-East	–50.8	24.4	–20.9	–33.7
South-Muntenia	–39.3	–19.5	–14.6	151.2
Bucharest – Ilfov	–49.7	–19.1	–13.1	–85.2
South-West Oltenia	–52.9	–25.6	–39.7	–47.1
West	–59.2	85.3	1.3	–9.5
Total	**–43.2**	**–7.9**	**–16.1**	**36.6**

Source: Calculations on the basis of data from Tempo-Online, NIS, 2012.

As regards the total milk production, this slightly increased by 2.3% in the year 2011 compared to 2000, as a result of the fluctuating evolutions across macro-regions and component regions. Thus, while in macro-region III the total milk production diminished by 21.2%, as a result of the changes produced in the component regions, in macro-region I, milk production increased by 11.8%. Finally, the honey, eggs and wool production followed a trend similar to the evolution of the number of animals. The increase in number of the bee families, correlated to the other influencing factors, led to the increase of extracted honey production by 128.1% in the year 2011 compared to the year 1990, by percentages ranging from +46.1% (macro-region III) to 171.8% (macro-region IV). The low marketing capacity of wool entailed wool production diminution, by almost half compared to its level in 1990, the strongest decline being noticed in macro-region III (–61.9%).

The egg production also followed a decreasing trend both per total country and by the four development macro-regions, being the cumulated effect of the changes produced at zonal level (Table 7).

Table 7

Changes produced in the structure of total honey, egg and wool production, at macro-regional level, in the year 2011 compared to the year 1990 (%)

	Extracted honey	**Eggs**	**Wool**
North-West	169.0	–11.1	–48.8
Center	160.9	–29.8	–9.8
North-East	123.6	–19.2	–51.9
South-East	121.7	–5.7	–62.9
South-Muntenia	53.0	–20.5	–61.2
Bucharest – Ilfov	–13.5	–86.1	–76.1
South-West Oltenia	140.4	–16.2	–54.9
West	219.9	–27.7	–42.6
Total	**128.1**	**–21.7**	**–50.2**

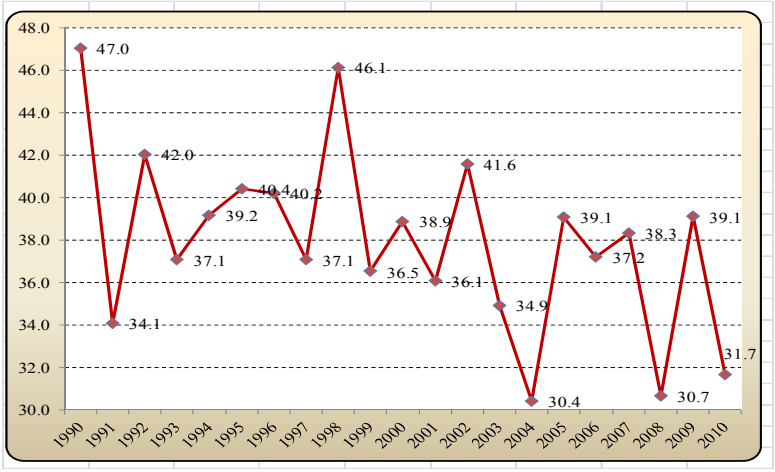
Source: Calculations on the basis of data from Tempo-Online, NIS, 2012.

4.3. The value of the agricultural animal production – expression of the available resource utilization level

The performance of an economic sector can be measured by using a battery of indicators, which can give an overall picture of the position of the respective sector in national economy. In the agricultural animal production, an effective indicator that directly reflects the available resources utilization level is represented by the gross value of livestock production.

From the methodological point of view, we must specify that for data comparability we proceeded to the transformation into the prices of the latest statistical year in the territory (macro-regional and regional), by using the GDP deflator.

In this sense, the value of the livestock production diminished in the year 2010 compared to 1990 by no less than –64.3%, with oscillations ranging from –68.3% (macro-region III) to –60.7% (macro-region I). As share in the total agricultural output value, the livestock production registered a 15.4 percent decline in 21 years' time, i.e. from 47% (1990) to 31.7% (2010) (Figure 2).



Source: Calculations on the basis of data from Tempo-Online, NIS, 2012.

Figure 2. Evolution of the share of the gross livestock production value in the gross agricultural output in the period 1990–2010 (%).

A differentiated evolution is also noticed with regard to the share of macro-regions in total country. Thus, from a share of 25.8% in the year 1990, the macro-region I reached 28.4% in the year 2010, while the macro-region III is at the opposite pole, with a diminution in the share of the livestock production value by 2.3%.

At regional level, it is worth mentioning the significant diminution of the livestock production value in the region Bucharest – Ilfov (–84.5% in the year 2010 compared to 1990), negative trends being also found in the other development regions (Table 8).

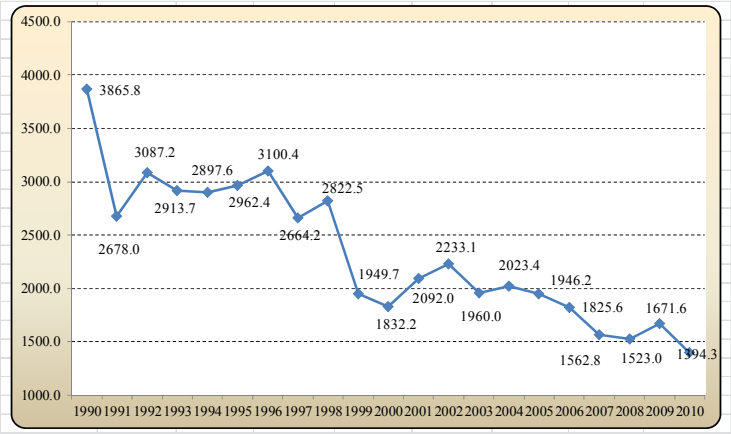
As share in total, a slight increase of 1.9% was noticed in the region Center, followed at a relative close distance by the regions North-East (+0.8 %) and North-West (+0.7%).

Finally, as efficiency degree expression, the value of the livestock production in relation to the agricultural land area diminished by 63.9% in a 21 years' period, which represents an average annual diminution rate by 4.97% (Figure 3).

Table 8
Evolution of the livestock production value by regions
in the period 1990–2010 (mil. lei in 2010 prices)

	North-West	Center	North-East	South-East	South-Muntenia	Bucharest – Ilfov	South-West Oltenia	West	Total
1990	8028	6725	10231	7513	10266	1287	6111	6932	57094
1991	5695	4823	7027	4862	7040	1093	4211	4879	39630
1992	6802	5418	8063	5449	7993	1178	5288	5469	45660
1993	6131	5368	7849	5115	7960	1093	4458	5128	43103
1994	6180	5396	7981	4909	7574	974	4681	5183	42878
1995	6431	5475	7912	5179	8005	963	4965	4904	43835
1996	7085	5826	8209	5431	8285	1025	4940	5050	45852
1997	6139	5068	7133	4517	6884	851	4397	4426	39415
1998	6195	5360	7536	4847	7488	787	5046	4519	41778
1999	4302	3748	5492	3446	5139	615	3352	2626	28720
2000	4066	3471	5347	3376	4700	465	3317	2478	27220
2001	4726	3998	5806	3779	5376	503	3845	3038	31071
2002	5072	4218	6160	4021	5766	521	4174	3200	33132
2003	4457	3702	5451	3602	4862	491	3489	2791	28847
2004	4348	4083	5501	3876	5126	541	3441	2853	29768
2005	4344	3921	5627	3549	5187	471	2984	2606	28689
2006	4033	3583	5144	3521	4798	511	2758	2545	26892
2007	3406	3074	4321	2986	4024	321	2540	2316	22987
2008	3296	3059	4253	2891	3909	313	2572	2098	22392
2009	3604	3365	4681	3162	4486	303	2552	2394	24547
2010	3003	2800	3822	2674	3469	199	1946	2494	20407
2010/ 1990 (%)	**–62.6**	**–58.4**	**–62.6**	**–64.4**	**–66.2**	**–84.5**	**–68.2**	**–64.0**	**–64.3**

Source: Calculations on the basis of data from Tempo-Online, NIS, 2012.



Source: Calculations on the basis of data from Tempo-Online, NIS, 2012.

Figure 3. Evolution of the livestock production /hectare of agricultural land
in the period 1990–2010 (2010 lei/ha).

4.4. The livestock production efficiency in non-conventional units – territorial allocation and disparities

In order to have an overall picture of the efficiency of available resources utilization, in the present approach we tried to construct two indicators, expressed in non-conventional units, per total country, macro-regions and regions. A first indicator is represented by the number of Large Livestock Units (LLU)/100 ha agricultural land. In this respect, for the transformation of the number of animals, the conversion coefficients into livestock units were used, as they are defined in the (EC) Regulation no. 1200/2009 of 30 November 2009 implementing Regulation (EC) no. 1166/2008 of the European Parliament and of the Council on farm structure surveys and the survey on agricultural production methods, as regards livestock unit coefficients and definitions of the characteristics.[2] The conversion coefficients used were the followings:

- bovines – 1.000;
- pigs – 0.500;
- sheep and goats– 0.100;
- horses – 0.800;
- poultry – 0.014;
- rabbits – 0.02.

Following the conversion coefficients application on the livestock herds[3], the number of LLUs per total country experienced a diminution from 15.12 million (1990) to 6.9 million (2011), i.e. by 54.4%. The same diminution trend can be also seen at macro-regional level, from –49% (macro-region II) to –59% (macro-region III). Per 100 hectares agricultural land, the number of LLUs was down by 53.8% in 2011 compared to 1990, as a result of the relatively small changes produced in the evolution of the agricultural land area. Significant fluctuations in the number of LLU/100 ha agricultural land were also noticed at macro-regional level, the decline in macro-region III (by –59.2%) and macro-region I (by –57.6%) being higher than the country average.

By regions, the most significant diminution was noticed in the development region Bucharest – Ilfov (–72.9%), which exceeds by 18.4% the national average, the same trend being maintained in the other regions as well, with oscillations ranging from –45.9% (Center) to –58.2% (South-Muntenia). The diminution of the agricultural area at regional level by a lower percentage than the diminution in the LLU number determined the decrease in the LLU number /100 ha agricultural land by percentages ranging from –69.8% (Bucharest – Ilfov) to –44% (Center). In fact, out of the 8 development regions, the diminution of the livestock number exceeds the national average, in percentage, in three regions (Bucharest – Ilfov, South-Muntenia, and West).

[2] Published in the Official Journal of the European Union L329/1/15.12.2009.

[3] Less for bees families; at the same time, for the period 1990–2000, the number of rabbits were not taken into consideration, as no statistical data were available.

A second indicator utilized in measuring the livestock production efficiency refers to the physical output evolution, expressed in Cereal Units (CU), per 100 hectares agricultural land. For the transformation into cereal units, a series of coefficients [4] were used, as follows:

- bovines – 5.9;
- pigs – 3.5;
- poultry – 2.7;
- sheep and goats – 8.4;
- eggs – 2.57.

We must specify that the physical production of honey, wool and milk was not taken into consideration, as there was no sufficient information on coefficients or the data series were incomplete. From this point of view, the analysis refers to the period 2000–2010, so as to ensure data homogeneity. By applying the coefficients mentioned above, it resulted that in the period 2000–2010, the physical production, expressed in cereal units, diminished by 29.6% per total country, as result of the involutions noticed at the level of macro-regions and development regions. Thus, from 28,460 mil. CU in the year 2000, the production reached 20,031 mil. CU in the year 2010. At macro-regional level, the most significant diminution was found in macro-region III (–38%), exceeding the national average by 8.7% (Table 9).

Table 9
Evolution of physical production expressed in CU (mil.CU)

	Macroreg. I	**Macroreg. II**	**Macroreg. III**	**Macroreg. IV**	**Total**
2000	6716.6	8560.4	6991.4	6192.0	28460.3
2001	6117.9	7975.2	6376.4	5534.9	26004.4
2002	5674.1	7105.7	5701.8	5072.7	23554.2
2003	5447.0	7326.5	5384.8	4701.0	22859.3
2004	5129.1	6823.8	5094.4	4674.0	19807.2
2005	5281.9	7020.1	5049.7	4395.2	21746.9
2006	5473.8	6967.3	4927.6	4380.1	21748.7
2007	5276.3	6576.2	4377.3	4202.4	20432.2
2008	5248.2	6601.1	4232.8	4291.9	20373.9
2009	5208.8	6807.7	4687.7	4021.0	20725.3
2010	4805.0	6583.7	4337.6	4304.3	20030.6
2010/2000 (+/–)	–28.5	–23.1	–38.0	–30.5	–29.6

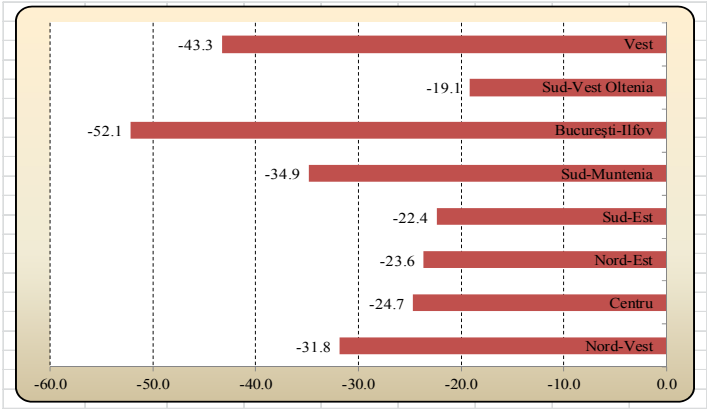
Source: Calculations on the basis of the paper: Kreitmair, S. (1989), *Neuberechnung der Gesantversorgung und landwirtschaftlichen Erzengnissen*, no. 4, Agrarwirtschaft.

At regional level, the physical production, expressed in mil. CU had a diminution tendency in all the 8 component regions, by percentages exceeding 50% in some cases (region Bucharest – Ilfov) (Figure 4).

[4] Kreitmair, S. (1989), *Neuberechnung der Gesantversorgung und andwirtschaftlichen Erzengnissen*, no. 4, Agrarwirtschaft.

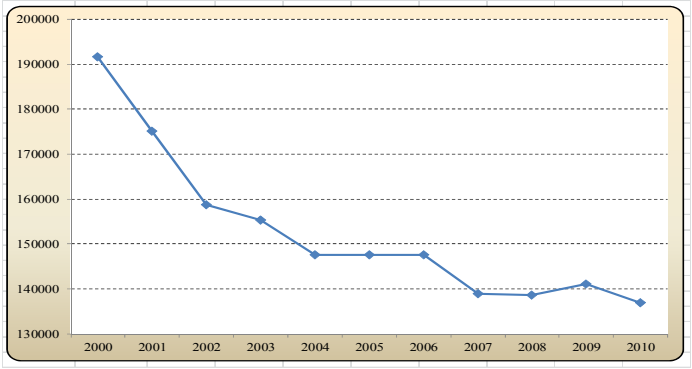
The physical production, in CU, per 100 hectares agricultural land, followed the same decreasing trend, yet by lower percentages, due to the evolutions of the agricultural land areas. Thus, from 191.6 thou. CU/100 ha agricultural land in the year 2000, it reached 136.9 thou. CU/100 ha agricultural land in the year 2010, which represents a diminution by 28.6% (Figure 5).

At the level of development macro-regions, the most significant decline came from macro-region III (–37.4%), mainly due to the diminution from the component region Bucharest – Ilfov (–46.1%). In fact, the region Bucharest – Ilfov had the most significant diminution of the physical production in thousand CU/100 ha agricultural land, namely from 1058.6 thou. CU/100 ha (2000) to 570.5 thou.CU /100 ha (2010), with an annual average decreasing rate of 5.99%.



Source: Calculations on the basis of the paper: Kreitmair, S. (1989), *Neuberechnung der Gesantversorgung und landwirtschaftlichen Erzengnissen*, no. 4, Agrarwirtschaft.

Figure 4. Changes produced in the dynamics of the physical production, expressed in mil. CU at regional level, 2010/2000 (%).



Source: Calculations on the basis of the paper: Kreitmair, S. (1989), *Neuberechnung der Gesantversorgung und landwirtschaftlichen Erzengnissen*, no. 4, Agrarwirtschaft.

Figure 5. Evolution of the physical production expressed in thousand CU/100 ha agricultural land.

5. CONCLUSIONS

As integrating part of the gross value added formation and of the agrifood sector position in the overall picture of the national economy, the agricultural livestock production had a fluctuating evolution in the period after 1990, generated, on one hand, by the modality of using and valorization of the production factors, and on the other hand, by the influences coming from the exterior of the sector, with direct impact upon the general efficiency level. The changes produced at county, regional and macro-regional level, in the sphere of production resources/ factors, had a noticeable influence upon the value of the obtained livestock production.

From the analysis above, the following conclusions can be drawn:

- The diminution by almost 64% of the value of the agricultural animal production, expressed in the prices of the year 2010, as well as of its share in the total agricultural production value by 15.4%;
- As an essential resource in the agricultural production, the livestock herds considerably declined in the period 1990–2011, by –10.9% in horses to –63% in bovines; an exception is represented by the bee families, which followed an increasing trend, as a result of the importance lately allocated to bee-keeping, correlated with the possibilities to sell the different bee-hive products;
- The involutions in the livestock herds also influenced the level of the obtained physical production; thus, for example, the total meat production was down by 41.5% in 2010 compared to 1990, with important fluctuations across macro-regions and development regions;
- Expressed in non-conventional units (large livestock units), the livestock numbers decreased by 54.4% in the year 2011 as compared to 1990, with macro-regional oscillations ranging from –49% (macro-region II) to –59% (macro-region III); the LLU number per 100 hectares agricultural land was down by 53.8% in 2011 compared to 1990, as a result of the relatively small changes produced in the agricultural land evolution;
- The same regression trend can be also noticed at the level of the physical production expressed in cereal units per 100 ha agricultural land; thus, from 191.6 thou. CU/100 ha agricultural land in the year 2000, it reached 136.9 thou. CU/100 ha agricultural land in the year 2010, i.e. a 28.6% diminution.

The conclusions drawn until now give us the right to conclude that, after 22 de years of trying to adjust to the market economy's rigours, the utilization of existing resources and their efficient valorization, which could permit to obtain a significant value of the agricultural animal production, is still confronted with a series of obstacles, generated either by the inconsequence of the decision factors in the implementation of adequate policies in the field, or by the continuing presence of some structural deficiencies that hinder the development process. The agricultural finance, regardless of their source, can represent an important step in

the sector recovery, if they are used and distributed according to the real needs and scope, with a direct impact upon the general level of efficiency and competetiveness.

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